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| 10/525,526      | 02/24/2005  | Ryo Motohashi        | P26642              | 7035             |

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EXAMINER

GUIDOTTI, LAURA COLE

ART UNIT PAPER NUMBER

1744

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/525,526

Applicant(s)

MOTOHASHI ET AL.

Examiner

Laura C. Guidotti

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 05242005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 3-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites, "...wherein alternative of the first magnetic circuit and the second magnetic circuit can be activated." This is unclear to the Examiner, as it is confusing and unclear as to what is being claimed.

Claim 4 recites, "...an inverter for generating two driving currents having predetermined frequencies and a phase difference therebetween, *and supplied* to the first magnetic circuit and the second magnetic circuit." It appears as if a word may be missing or the grammar needs correcting as the Examiner is unclear as to "what" is supplied, although the Examiner is assuming that the driving currents are supplied to the first and second magnetic circuit.

Claims 7, 8, and 11 each recite the limitation "the second *driving* circuit" in Line 3 (Claims 7 and 8) or Line 4 (Claim 11). There is insufficient antecedent basis for this limitation in the claim. Is there a second driving circuit or did Applicant intend "the second *driving* circuit" to be "the second magnetic circuit"?

Claim 4 requires "...two driving currents having...a *phase difference* therebetween..." However claim 7, which depends from claim 4, states that "...the

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driving currents...*are in phase*." This seems contradictory and is unclear to the Examiner.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792 in view of Swift, US 6,798,087.

Wiedemann et al. disclose a power toothbrush comprising a brush head (5) and an actuator for moving the brush head (entirety shown in Figure 3) for reciprocally moving a brush head in a linear direction of a longitudinal axis (8; Figures 1-2) and in a rotary direction about a longitudinal axis (9; Figures 1-2) in order to thoroughly loosen and wipe tooth surfaces (Column 2 Lines 5-17, 42-50). The brush head (5) is fitted to a

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drive shaft (3). Wiedemann et al. does not disclose that the actuator includes a first or second magnetic circuit.

Swift teaches an actuator that has a drive shaft (130), a first magnetic circuit capable of reciprocally moving the drive shaft in an axial direction (includes 140, 170; Column 3 Lines 46-60, Column 4 Lines 7-11), and a second magnetic circuit capable of reciprocally rotating the drive shaft around the center axis thereof (includes 150, 180; Column 3 Lines 61-67, Column 4 Lines 11-14), and the first magnetic circuit and the second magnetic circuit directly move the drive shaft (Column 1 Lines 59-60; Column 4 Lines 7-16). Regarding claim 2, the first magnetic circuit and the second magnetic circuit are capable of being activated simultaneously (Column 6 Lines 10-22).

Regarding claim 3, the first magnetic circuit and the second magnetic circuit can be activated (Column 6 Lines 10-22). Swift teaches that it is known that rotary-linear actuators such as this are used to provide precise, repeatable actions (Column 1 Lines 15-17).

It would have been obvious for one of ordinary skill in the art to substitute the entire actuator system of Wiedemann et al. for one that has an actuator system that has first and second magnetic circuits, as Swift teaches, in order to provide precise and repeatable actions linearly along a longitudinal axis and rotationally about a longitudinal axis.

3. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792 and Swift, US 6,798,087 as applied to claim 1, in view of Li, US 6,429,611.

Wiedemann et al. and Swift disclose all elements mentioned above. The actuator of Swift further includes encoders that sense a position of portions of the assembly and provides a signal indicative of the linear and rotational positions of the assembly to a control system (Column 2 Lines 10-24; Column 5 Lines 19-35).

Wiedemann et al. and Swift do not include an inverter.

Li teaches a rotary and linear motor that also uses sensors (32) and (34) to indicate a linear displacement or a rotary angle of a rotor (12) and feeds this data back to motor control algorithms (Column 4 Lines 3-6). Li further teaches the use of an inverter (26) capable of generating currents having predetermined frequencies and a phase difference therebetween, and supplied to the first magnetic circuit and a second magnetic circuit (there are three magnetic circuits 18a-18c; Column 3 Lines 58 to Column 4 Line 3, Column 4 Lines 7-58). Regarding claim 5, the driving currents are inherently alternating currents (AC) as “an inverter” by definition is “a device used to convert direct current into alternating current” (*The American Heritage® Dictionary of the English Language, Fourth Edition Copyright © 2000 by Houghton Mifflin Company.*) Regarding claim 6, the frequencies and/or phase difference between the currents are capable of being adjustable (via altering a software program, Column 4 Line 59 to Column 5 Line 15).

It would have been obvious for one of ordinary skill in the art to modify the control system of the actuator of Wiedemann et al. and Swift, to include an inverter, as Li teaches, in order to responsively control the driving currents supplied to the circuits.

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4. Claims 1, 3, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792 in view of Kofink, DE 29 06 404 (see English translation of Abstract).

Wiedemann et al. disclose a power toothbrush comprising a brush head (5) and an actuator for moving the brush head (entirety shown in Figure 3) for reciprocally moving a brush head in a linear direction of a longitudinal axis (8; Figures 1-2) and in a rotary direction about a longitudinal axis (9; Figures 1-2) in order to thoroughly loosen and wipe tooth surfaces (Column 2 Lines 5-17, 42-50). The brush head (5) is fitted to a drive shaft (3). Wiedemann et al. does not disclose that the actuator includes a first or second magnetic circuit.

Kofink teaches an actuator that has a drive shaft (4), a first magnetic circuit for reciprocally moving the drive shaft in an axial direction thereof (at 11), and a second magnetic circuit for reciprocally rotating the drive shaft around the center thereof (at 9), the first magnetic circuit and the second magnetic circuit directly move the drive shaft (see directional arrows in the Figure and Abstract). Regarding claim 3, the first magnetic circuit and the second magnetic circuit can be activated (activated via circuitry, see Figure). Regarding claim 12, the first magnetic circuit (at 11) further comprises a first permanent magnet unit fixed to the drive shaft (12; Abstract), a pair of first stators (8) and a pair of first windings respectively wound around the first stators (13), the second magnetic circuit further comprises a second permanent magnet unit fixed on the drive shaft (10), a pair of second stators (7) and two pairs of second windings wound around poles of the second stator (as it appears in the Figure that each

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stator has a winding wound twice, or a pair of windings on each stator), the first permanent magnet unit is linearly moved in the axial direction of the drive shaft while a driving current is supplied to the first windings (Figure, directional arrow, Abstract) and the second permanent magnet unit is rotated around the center axis of the drive shaft while a driving current is supplied to the second windings (Figure, directional arrow, Abstract).

It would have been obvious for one of ordinary skill in the art to substitute the entire actuator system of Wiedemann et al. for one that has an actuator system that has first and second magnetic circuits, as Kofink teaches, in order to provide reciprocal motion in both a linear and rotary direction.

5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wiedemann et al., US 5,448,792 and Kofink, DE 29 06 404 (see English translation of Abstract) as applied to claim 12, in view of Kunita et al., US 2004/0128781.

The applied reference (Kunita et al.) has a common assignee and two common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130



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stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Wiedemann et al. and Kofink disclose all elements above, however do not include a pair of coil springs.

Kunita et al. discloses a linear oscillator for an electrically driven toothbrush that teaches the use of a pair of coil springs (60, 61; Figure 3) that are capable of applying pressing forces for positioning a magnetic reciprocating plunger (1) that responds to current (paragraphs 32-33, 38). Regarding claims 14-15, the magnetic circuit (formed by 1 and 20, 21, 30, and 31) is periodically driven by switching on and off of supplying driving current (as the current is alternating current, paragraphs 35-36 and 38), and the reciprocal movement of the drive shaft is sustained owing to sympathetic vibrations of the coil springs while the driving current is not supplied to the circuit (paragraphs 35-36, 38).

It would have been obvious for one of ordinary skill in the art to modify the actuator of Wiedemann et al. and Kofink by including a pair of coil springs, as Kunita et al. teach, so that each coil spring applies a resilient force to one permanent magnet unit and thereby promotes reciprocal movement of the permanent magnet unit.

***Allowable Subject Matter***

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6. Claims 7-11 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

None of the prior art made of record includes a power toothbrush comprising a brush head and an actuator, wherein the actuator further comprises a drive shaft to which the brush head is fitted, a first magnetic circuit for reciprocally moving the drive shaft in an axial direction thereof, and a second magnetic circuit for reciprocally rotating the drive shaft around the center axis thereof, and the first magnetic circuit and the second magnetic circuit directly move the drive shaft, wherein an inverter for generating two driving currents having predetermined frequencies and a phase difference therebetween, and supplied to the first magnetic circuit and the second magnetic circuit, wherein (A) the driving currents supplied to the first magnetic circuit and the second driving circuit are in phase or (B) the phase difference between the driving currents supplied to the first magnetic circuit and the second driving circuit is  $\pi/2$  or  $\pi/4$  or (C) a frequency of a driving current supplied to the first magnetic circuit is equal to or an integral multiple of a frequency of a driving current supplied to the second magnetic circuit or (D) wherein a frequency of a driving current supplied to the second magnetic circuit is equal to or an integral multiple of a frequency of a driving current supplied to the first magnetic circuit or (E) wherein a ratio of a larger one in the frequencies of the

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driving currents supplied to the first magnetic circuit and the second driving circuit with respect to a smaller one of them is not an integer.

***Conclusion***


8. Additionally, US 2002/100129, US 2002/116775, US 2002/084707, US 6,140,723, DE 4002199, and EP 1193844 were all cited in an International Search Report of February 2004 and are considered somewhat relevant as they include structural elements similar to what is required by the present Application. However, after further searching and reconsideration of the claims by the Examiner, the prior art cited by the Examiner in the present Office Action are more pertinent to the claimed subject matter than those cited in the International Search Report.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura C. Guidotti whose telephone number is (571) 272-1272. The examiner can normally be reached on Monday-Thursday, 7:30am - 5pm, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys Corcoran can be reached on (571) 272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Laura C Guidotti  
Patent Examiner  
Art Unit 1744

lcg